

ABSTRACT

An electric control device 70 is applied to an internal combustion engine 10 capable of a pre-mixed charge compression ignition combustion in which air-fuel mixture gas including air and fuel injected from an injector 37 is formed in a combustion chamber 25, and the air-fuel mixture gas is self-ignited to be combusted by compressing the air-fuel mixture gas during a compression stroke. The electric control device injects high pressure fluid such as air from the air injection valve 38 into the air-fuel mixture gas at a predetermined acting timing within a compression stroke prior to fuel pyrolysis starting timing to enhance the temperature un-uniformity of the air-fuel mixture gas. This enables the temperature un-uniformity of the air-fuel mixture gas at the fuel pyrolysis starting timing to become larger than the temperature un-uniformity of the air-fuel mixture gas at the fuel pyrolysis starting timing obtained only by simply compressing the air-fuel mixture gas during the compression stroke. As a result, the combustion is moderated and the combustion noise is reduced.